

What is claimed is:

1. A color-image pickup device comprising:

a color filter unit which includes R filters, G filters, B filters, and an optical element having a dielectric multilayer film for infrared blocking, for decomposing light into a first component in a red wavelength range, a second component in a green wavelength range, and a third component in a blue wavelength range, wherein the R filters determine a lower wavelength limit of the red wavelength range, the G filters determine the green wavelength range, the B filters determine the blue wavelength range, and the dielectric multilayer film determines an upper wavelength limit of the red wavelength range;

an image pickup unit which is placed in a stage following said color filter unit, includes a plurality of photoelectric conversion elements being arranged in a light-reception area to receive said first, second, and third components, picks up an optical image from the first, second, and third components received by the plurality of photoelectric conversion elements, and outputs picture signals corresponding to the first, second, and third components;

a color-picture-signal generation unit

which generates a color-picture signal based on said picture signal outputted from said image pickup unit; and

a transmittance distribution means for  
5 realizing a spatial distribution of a ratio of a transmittance of said first component received by ones of said plurality of photoelectric conversion elements arranged in each portion of said light-reception area to a transmittance of each of the  
10 second and third components received by ones of the plurality of photoelectric conversion elements arranged in each said portion of the light-reception area, so that the ratio increases with a distance  
15 from a center of said light-reception area to each said portion of the light-reception area.

2. A color-image pickup device according to claim 1, wherein said ratio is increased by increasing the transmittance of the first component received by each said of the plurality of  
20 photoelectric conversion elements with the distance from the center of said light reception area to each said portion of the light reception area.

3. A color-image pickup device according to claim 1, wherein each of said R filters has a  
25 transmittance which increases with a distance from said center of the light-reception area to each of

said R filters so that the R filters realize the transmittance distribution means.

4. A color-image pickup device according to claim 2, wherein each of said R filters has a  
5 transmittance which increases with a distance from said center of the light-reception area to each of said R filters so that the R filters realize the transmittance distribution means.

5. A color-image pickup device comprising:

10 a color filter unit which includes R filters, G filters, B filters, and an optical element having a dielectric multilayer film for infrared blocking, for decomposing light into a first component in a red wavelength range, a second  
15 component in a green wavelength range, and a third component in a blue wavelength range, wherein the R filters determine a lower wavelength limit of the red wavelength range, the G filters determine the green wavelength range, the B filters determine the  
20 blue wavelength range, and the dielectric multilayer film determines an upper wavelength limit of the red wavelength range;

an image pickup unit which is placed in a stage following said color filter unit, includes a plurality of photoelectric conversion elements being arranged in a light-reception area to receive said  
25

first, second, and third components, picks up an optical image from the first, second, and third components received by the plurality of photoelectric conversion elements, and outputs a  
5 first picture signal corresponding to said first component, a second picture signal corresponding to said second component, and a third picture signal corresponding to said third component;

an amplifier which separately amplifies  
10 said first, second, and third picture signals in such a manner that a ratio of a first gain of the first picture signal corresponding to said first component received by ones of said plurality of photoelectric conversion elements arranged in each  
15 portion of said light-reception area to each of second and third gains of said second and third picture signals corresponding to said second and third components received by ones of the plurality of photoelectric conversion elements arranged in each said portion of the light-reception area increases with a distance from a center of the light-reception area to each said portion of the light-reception area; and

a color-picture-signal generation unit  
25 which generates a color-picture signal based on said first, second, and third picture signals amplified

by said amplifier.

6. A color-image pickup device according to claim 5, wherein said ratio is increased by increasing said first gain of the first picture signal corresponding to said first component received by each of the plurality of photoelectric conversion elements with said distance from the center of said light reception area to each said portion of the light reception area.

10 7. A color-image pickup device comprising:

a color filter unit which includes R filters, G filters, B filters, and an optical element having a dielectric multilayer film for infrared blocking, for decomposing light into a first component in a red wavelength range, a second component in a green wavelength range, and a third component in a blue wavelength range, wherein the R filters determine a lower wavelength limit of the red wavelength range, the G filters determine the green wavelength range, the B filters determine the blue wavelength range, and the dielectric multilayer film determines an upper wavelength limit of the red wavelength range;

an image pickup unit which is placed in a stage following said color filter unit, includes a plurality of microlenses and a plurality of

photoelectric conversion elements being arranged in  
a light-reception area to receive said first, second,  
and third components through the plurality of  
microlenses, picks up an optical image from the  
5 first, second, and third components received by the  
plurality of photoelectric conversion elements, and  
outputs picture signals corresponding to the first,  
second, and third components; and

10 a color-picture-signal generation unit  
which generates a color-picture signal based on said  
first, second, and third picture signals outputted  
from said image pickup unit;

wherein relative positions between each of  
said plurality of photoelectric conversion elements  
15 and one of said plurality of microlenses  
corresponding to the photoelectric conversion  
element are set in such a manner that a ratio of  
light-reception efficiency of the first component  
received by ones of said plurality of photoelectric  
conversion elements arranged in each portion of said  
20 light-reception area to light-reception efficiency  
of the second and third components received by ones  
of the plurality of photoelectric conversion  
elements arranged in each said portion of the light-  
reception area increases with a distance from a  
25 center of the light-reception area to each said

portion of the light-reception area.

8. An electronic color camera comprising:

an image-forming optical system; and

a color-image pickup device optically

5 coupled to said image-forming optical system;

wherein said color-image pickup device  
includes,

a color filter unit which includes R  
filters, G filters, B filters, and an optical  
10 element having a dielectric multilayer film for  
infrared blocking, for decomposing light into a  
first component in a red wavelength range, a second  
component in a green wavelength range, and a third  
component in a blue wavelength range, wherein the R  
15 filters determine a lower wavelength limit of the  
red wavelength range, the G filters determine the  
green wavelength range, the B filters determine the  
blue wavelength range, and the dielectric multilayer  
film determines an upper wavelength limit of the red  
20 wavelength range,

an image pickup unit which is placed  
in a stage following said color filter unit,  
includes a plurality of photoelectric conversion  
elements being arranged in a light-reception area to  
25 receive said first, second, and third components,  
picks up an optical image from the first, second,

and third components received by the plurality of photoelectric conversion elements, and outputs picture signals corresponding to the first, second, and third components,

5                   a color-picture-signal generation unit which generates a color-picture signal based on said picture signal outputted from said image pickup unit, and

10                  a transmittance distribution means for realizing a spatial distribution of a ratio of a transmittance of said first component received by ones of said plurality of photoelectric conversion elements arranged in each portion of said light-reception area to a transmittance of each of the 15 second and third components received by ones of the plurality of photoelectric conversion elements arranged in each said portion of the light-reception area so that the ratio increases with a distance from a center of said light-reception area to each 20 said portion of the light-reception area.

9. An electronic color camera comprising:

an image-forming optical system; and  
a color-image pickup device optically coupled to said image-forming optical system;  
25                  wherein said color-image pickup device includes,

a color filter unit which includes R filters, G filters, B filters, and an optical element having a dielectric multilayer film for infrared blocking, for decomposing light into a  
5 first component in a red wavelength range, a second component in a green wavelength range, and a third component in a blue wavelength range, wherein the R filters determine a lower wavelength limit of the red wavelength range, the G filters determine the  
10 green wavelength range, the B filters determine the blue wavelength range, and the dielectric multilayer film determines an upper wavelength limit of the red wavelength range,

an image pickup unit which is placed  
15 in a stage following said color filter unit, includes a plurality of photoelectric conversion elements being arranged in a light-reception area to receive said first, second, and third components, picks up an optical image from the first, second,  
20 and third components received by the plurality of photoelectric conversion elements, and outputs a first picture signal corresponding to said first component, a second picture signal corresponding to said second component, and a third picture signal corresponding to said third component,  
25

an amplifier which separately

amplifies said first, second, and third picture signals in such a manner that a ratio of a first gain of the first picture signal corresponding to said first component received by ones of said plurality of photoelectric conversion elements arranged in each portion of said light-reception area to each of second and third gains of said second and third picture signals corresponding to said second and third components received by ones of the plurality of photoelectric conversion elements arranged in each said portion of the light-reception area increases with a distance from a center of the light-reception area to each said portion of the light-reception area, and

a color-picture-signal generation unit which generates a color-picture signal based on said first, second, and third picture signals amplified by said amplifier.

10. An electronic color camera comprising:

an image-forming optical system; and

a color-image pickup device optically coupled to said image-forming optical system;

wherein said color-image pickup device includes,

25 a color filter unit which includes R filters, G filters, B filters, and an optical

element having a dielectric multilayer film for infrared blocking, for decomposing light into a first component in a red wavelength range, a second component in a green wavelength range, and a third component in a blue wavelength range, wherein the R filters determine a lower wavelength limit of the red wavelength range, the G filters determine the green wavelength range, the B filters determine the blue wavelength range, and the dielectric multilayer film determines an upper wavelength limit of the red wavelength range,

an image pickup unit which is placed in a stage following said color filter unit, includes a plurality of microlenses and a plurality of photoelectric conversion elements being arranged in a light-reception area to receive said first, second, and third components through the plurality of microlenses, picks up an optical image from the first, second, and third components received by the plurality of photoelectric conversion elements, and outputs picture signals corresponding to the first, second, and third components, and

a color-picture-signal generation unit which generates a color-picture signal based on said first, second, and third picture signals outputted from said image pickup unit;

wherein relative positions between each of  
said plurality of photoelectric conversion elements  
and one of said plurality of microlenses  
corresponding to the photoelectric conversion  
5 element are set in such a manner that a ratio of  
light-reception efficiency of the first component  
received by ones of said plurality of photoelectric  
conversion elements arranged in each portion of said  
light-reception area to light-reception efficiency  
10 of the second and third components received by ones  
of the plurality of photoelectric conversion  
elements arranged in each said portion of the light-  
reception area increases with a distance from a  
center of the light-reception area to each said  
15 portion of the light-reception area.